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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,631	11/26/2001	Makoto Hazama	011530	4677

			EXAMINER
38834	7590	11/30/2004	LY, CHEYNE D

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ART UNIT	PAPER NUMBER
1631	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/991,631	HAZAMA, MAKOTO
	Examiner	Art Unit
	Cheyne D Ly	1631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _30 August 2004_.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-11,14,16 and 17_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) _1-11,14,16 and 17_ is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on August 30, 2004 has been entered.

2.   The cancellation of claims 12, 13, and 15, and the addition of new claim 17 have been

acknowledged.

3.   Applicant's request that the amendments in the response filed on June 10, 2004 has been

acknowledged.

4.   Claims 1-11, 14, 16, and 17 are examined on the merits.

PRIORITY

5.   Applicant's claim for priority to Japan 2000-362648, filed November 29, 2000, has been

acknowledged. However, the priority benefit to Japan 2000-362648, filed November 29, 2000,

has not been granted because Japan 2000-362648 is not in the English language. It is noted that

an English language translation of a non-English language foreign application is required in

order to grant to a US nonprovisional application priority benefits to a foreign application. For

the instant Application, an English language translation of the priority document is not required

due to the prior art documents being published before said priority document. However, if

Applicant requires that priority benefit be granted, it is suggested that Applicant provide a

certified English language translation of the priority document.

AMENDMENT INFORMALITIES

6.   Specific to claims 12 and 13, Applicant includes strikethrough markings in cancelled claims which is improper. Appropriate correction is required. Applicant is required to indicate claims as being "(canceled)" without presenting the text of the cancelled claim.

CLAIM REJECTIONS - 35 U.S.C. § 112, FIRST PARAGRAPH

7.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8.   Claims 1-11, 14, 16, and 17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

9.   It is noted that the amendments in the response filed on June 10, 2004 has been entered. This instant rejection is directed amendments filed on June 10, 2004, and August 30, 2004.

RESPONSE TO REMARKS

10.   Applicant's pointed to disclosure for written description basis support for the claims amendments has been fully considered and found to be unpersuasive as discussed below.

11.   Specific to claim 1, line 2, the limitation of "actual sample of nucleic acid" is considered to be new matter because said limitation has not been found in the instant specification. It is acknowledged that the limitation of "actual sample" is disclosed in the instant specification (page

4, line 22) and "nucleic acid" (page 1, line 6). However, the limitation of "actual sample of

nucleic acid" is different from either of "actual sample" or "nucleic acid" due to the limitations

being different in scope. Claims 2-11, 14, 16, and 17 are rejected for being dependent from

claim 1.

12.   Specific to claim 5, lines 3-4, the limitation of "the largest peak numbers" is considered

to be new matter because said limitation is different from that of "largest fluorochrome signal"

(page 6, line 6) and "largest signal" (page 7, line 12).

13.   Claim 11, lines 3-4, the new limitation of "the sensitivities of the detection parts as to

bases A, T, G, and C" has not been found in the instant specification. It is acknowledged that the

pointed to support (page 8, lines 28-30) discloses "Pa is the strongest for a peak of

A(adenine),…and Pc is the strongest for C(cytosine)." Further, the disclosure in the currently

cancelled claim 12 does not provide proper written description basis for said new limitation.

14.   Claim 17, lines 1-3, recites the limitation of "peaks having signal strengths of

fluorochromes…are eliminated as abnormal" has not been found in the instant specification. It is

noted that the pointed to support discloses "when the signal strengths…peaks thereof are

eliminated as abnormality" (page 6, lines 24-27). Claim 17 recites "peaks having signal

strengths of fluorochromes…larger than signal strengths of…are eliminated as abnormal" which

is not supported by the broader disclosure of "peaks thereof are eliminated as abnormality." It is

noted that the broader disclosure does not specify that the peaks having larger signal strengths be

eliminated as abnormal.

CLAIM REJECTIONS - 35 U.S.C. § 112, SECOND PARAGRAPH

15.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16.   Claims 1-11, 14, 16, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

17.   The preamble, lines 1-6, of claim 1 recites steps for "obtaining a matrix value for sequence determination of an actual sample of nucleic acid performing matrix transformation from detected signal waveform to emitted signal waveform...the nucleic acid on the basis thereof." While, lines 6-17 recite "the method obtains the matrix value for performing the matrix transformation from migration of the actual sample through steps of..." As cited above, claim 1 could reasonably construed as reciting two methods for "obtaining a matrix value" wherein the first method obtains "a matrix value" from "detected signal waveform to emitted signal waveform." The second method obtains "a matrix value" from "migration of the actual sample through steps of..." However, claim 1 does not recite any steps for the actual "migration" of samples. It is unclear whether the detection data or actual sample is being migrated through steps (1) to (6). Therefore, claim 1 is vague and indefinite because the metes and bounds of said claim is unclear. Claims 2-11, 14, 16, and 17 are rejected for being dependent from claim 1.

18.   Claim 1, line 9, recites the phrase "proper range" and line 11, recites the phrase "irregular peak intervals" which cause said claim to be vague and indefinite because it is unclear what criteria are being used to determined the "proper range" or "irregular peak intervals." Clarification of the metes and bounds is required. Claims 2-11, 14, 16, and 17 are rejected for being dependent from claim 1.

19.   Claim 1, lines 12-13, the limitation of "classifying…in response to the signal strengths"

causes said claim to be vague and indefinite because it is unclear whether each of the four groups

comprises a specific type of bases or a plurality of "types of bases." Claims 2-11, 14, 16, and 17

are rejected for being dependent from claim 1.

20.   Claim 3, lines 3-4, the limitation of "a used sequence determination program" causes said

claim to be vague and indefinite because it is unclear what criteria are used to determine "a used

sequence determination program."

21.   Claim 3 recites "according to claim 1, wherein the peaks extracted in the step (1) are such

peaks that the strength of the maximum fluorochrome signal" which causes said claim to be

vague and indefinite because step (1) of claim 1 does not calculate signal strength. It is noted

that step (4) of claim 1 recites "calculating signal strength ratios." Therefore, it is unclear

whether the limitation of "the strength of the maximum fluorochrome signal" is being directed to

"waveform signal" step (1) or "signal strength ratios." The same issue is present in claim 4

22.   Claim 3 recites the limitation of "the minimum standard" in line 3. There is insufficient

antecedent basis for this limitation in the claim because claim 1 from which claim 3 depends

does not recite any limitation for determining the "standard".

23.   Claim 4, line 3, recites the limitation of "according to claim 1,…adjacent waveforms are

eliminated in the step (1)" causes said claim to be vague and indefinite because it is unclear

whether the "adjacent waveforms are eliminated in the step (1)" because claim 1 step (1) does

not recite any "elimination step". Are the "adjacent waveforms are eliminated in the step (1)"

before claim 4? Or the adjacent waveforms eliminated at the end of the method as recited by

claim 4. Clarification of the metes and bounds is required.

CLAIM REJECTIONS - 35 USC § 102

24.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

25.   Claims 1-8, 10, 11, 14, and 16 are rejected under 35 U.S.C. 102(b) as being clearly

anticipated by Giddings et al. (1993).

26.   Giddings et al. discloses a method for using an algorithm for determining DNA sequence

from a fluorescence-based sequencing instrument comprising a detection system for determining

the concentration of the sample in the detection region at any time during electrophoresis

(migration) (page 4531, column 1, Data collection and preparation §). The method comprises an

algorithm for a matrix transformation by a multi-component analysis to determine the relative

(ratio) concentrations of the four dyes from the fluorescence intensity (strength) measured at four

different wavelengths (page 4531, column 2, last paragraph, to page 4532, columns 1-2). "In the

four-color strategy, DNA fragments are labeled with one of four fluorophores depending upon

the nucleotide at which they terminate (A, C, G, or T) (page 4531, column 1, Data collection and

preparation §), as in instant claim 1, lines 1-8, and claim 14.

27.   Intensity data (peaks) are collected at four wavelengths (proper range) in the detection

region at specific intervals to generate a raw data file (page 4531, column 1, Pre-processing the

data §). Figure 4 provides a list of potential peaks (page 4534, column 1, lines 12-15), as in

instant claim 1, lines 9-10, and claim 2.

28.   The method of Giddings comprises several types of noise-removal (irregular peak intervals) techniques (page 4532, column 2, Noise filtering §, to page 4533, column 1). Further, it is desirable to eliminate those portions of the data that are irrelevant to analysis, which includes the data before the primer peak and data near the end of the run where resolution or sensitivity is low (irregular peak intervals) (page 4531, column 2, Data edition §), as in instant claim 1, line 11.

29.   The matrix (M) transformation comprises identifying a known peak in the raw trace for each of the four different fluorophores. For each of the identified peaks (classifying), the relative signal intensities at the four wavelengths are entered into a column of the matrix M (page 4532, column 1, lines 13-18, and Figure 2), as in instant claim 1, lines 12-14. It is noted that the limitation of ratio has been reasonably construed as a relative value. Due to the numerator and denominator not being specifically defined for said ratio, the cited relative value of Giddings et al. is consistent with the limitation of ratio of the instant claims.

30.   "The base calling task consists of identifying peaks, determining those that are likely to represent fragments, and assigning a confidence value to the peaks that are labeled as a particular base" such as A, C, G, or T (page 4533, column 2, Base calling §), as in instant claim 1, lines 15-16.

31.   For each of the identified peaks, the relative signal intensities at the four wavelengths are entered into a column of the matrix M (page 4532, column 1, lines 13-18), as in instant claim 1, line 17.

32.   The method of comprises establishing a globally flattened baseline, which has been reasonably construed as a "standard". The removal of baseline variations requires the

elimination of only very low frequency components in the frequency spectrum. The removal

step leaves the primary signal in the target frequency range (page 4533, column 1, lines 28-36).

Further, the peak-height module determines peaks by using the second order maxima and

minima process (page 4536, column 2, Peak-height module §). The peak determination cited

above has been reasonably construed to be "the strength of the maximum fluorochrome signal is

larger than the minimum standard for peak detection", as in instant claim 3.

33.   The method of Giddings starts with the creation of a peak list by finding all maxima

present in each of the four channels. The maxima present are sorted by the channel (waveform)

in which they occur, and the confidence level for each is calculated and eliminating those peaks

that are below a specified confidence cutoff value (page 4534, columns 1-2, Algorithm §), as in

instant claim 4. Due to the vague and indefinite issue of claim 4 as discussed above, the citation

of elimination step cited above has been reasonably construed to be consistent with the

limitations of claim 4.

34.   In determining sequences as directed to A, C, G, or T, equation 7 gives the highest

confidence value to a large peak that occurs without any significant overlap with signal in other

channels (page 4537, column 1, lines 7-9), as in instant claims 5 and 8.

35.   The third module utilizes half-height peak widths which represents central values for

calibration and confidence assignment. "The average peak width is determined and those which

are more than 1.5 times the average are counted as two or more peaks, with the measured width

being divided among them to achieve a ratio of c_i (page 4537, columns 1-2, Peak width module),

as in instant claims 6 and 7.

36.   "Thus once a suitable matrix is found it can be used without any modification for

subsequent analysis" (page 4532, column 1, last paragraph), as in instant claim 10. It is noted

that the limitation of "optimum matrix" has been reasonably construed as "suitable matrix" as

cited above.

37.   The method of Giddings et al. utilize an algorithm is adaptive in nature which allows

users to set parameters. The relatively simple parameters are directed to the width and spacing

tolerances that depend closely on the length of the data set and the resolution (sensitivities)

wherein said parameters are fine tuned for specific conditions to achieve optimal performance

(page 4537, column 2, Setting parameters §, and Tale 1), as in instant claim 11.

38.   The method of Giddings et al. comprises several types of noise-removal (irregular peak

intervals) techniques wherein the types of noise are classified as background noise, detector

noise, etc. (page 4532, column 2, Noise filtering §, to page 4533, column 1). Due to the

limitations of "additional groups" and "abnormal" not being specifically defined in the instant

specification, the cited disclosure above is consistent with the require limitations of claim 16.

CONCLUSION

39.   Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to (571) 272-0547.

40.   Patent applicants with problems or questions regarding electronic images that can be

viewed in the Patent Application Information Retrieval system (PAIR) can now contact the

USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are

available to answer your questions daily from 6 am to midnight (EST). The toll free number is

(866) 217-9197. When calling please have your application serial or patent number, the type of

document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

41.   For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

42.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to C. Dune Ly, whose telephone number is (571) 272-0716. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

43.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, Ph.D., can be reached on (571) 272-0722.

C. Dune Ly
11/29/04

MICHAEL P. WOODWARD
SUPERVISORY PATENT EXAMINER
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